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SERVICE

Thank you for purchasing our product!
As our customers are our top priority and we strive for 100% satisfaction, we would appreciate your feedback on the product.
Please contact our customer service department at (310) 728-6220 or at www.dawsontools.com if you have any questions regarding this product.
Our professional support team is always ready to answer your enquiries and provide assistance.

00-05-3843

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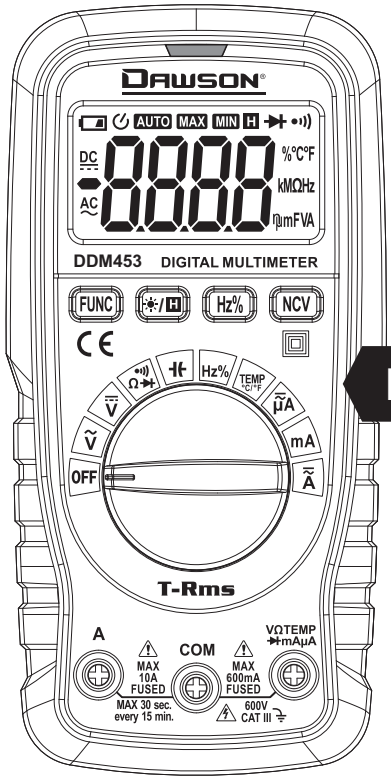
DIGITAL MULTIMETER



DDM453

Intertek 3080912

CAT.III 600V

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This instrument from Dawson Tools Inc. will be free from defects in workmanship and material for three years from the date of original purchase. This warranty does not cover defects resulting from damage caused by the user such as drops, neglect, misuse, unauthorized alteration, usage outside of specified conditions, contamination, or improper repair/maintenance. To receive service on the instrument if it becomes necessary during the warranty period, contact your nearest Dawson authorized service center at (800) 898-6991 or visit www.DawsonTools.com to obtain a return authorization (within the US only). A return authorization is necessary before returning anyinstrument to Dawson; no service will be provided without a return authorization. The user is responsible for properly packing the unit and charges such as shipping, freight and insurance charges. The extent of Dawson's liability is limited solely to the repair/replacement of the instrument. The above warranty in Its entirety is inclusive and no other warranties, written or oral, are expressed or implied.

Out of the Box

Check the meter and accessories thoroughly before using the meter. Contact your local distributor if the meter or any components are damaged or malfunction.

Accessories

- Test leads x1 pair
- User's manual x1
- 9V battery x1
- Type-K Thermocouple x1

1. INTRODUCTION

DDM453 is a stable, safe, reliable compact digital handheld 6000 count auto-ranging multimeter. This meter can measure AC/DC voltage, AC/DC current, resistance, capacitance, frequency, duty cycle, temperature, diodes and continuity. This meter is ideal for many situations, whether you're a professional or causal user.

2. ⚠ WARNINGS

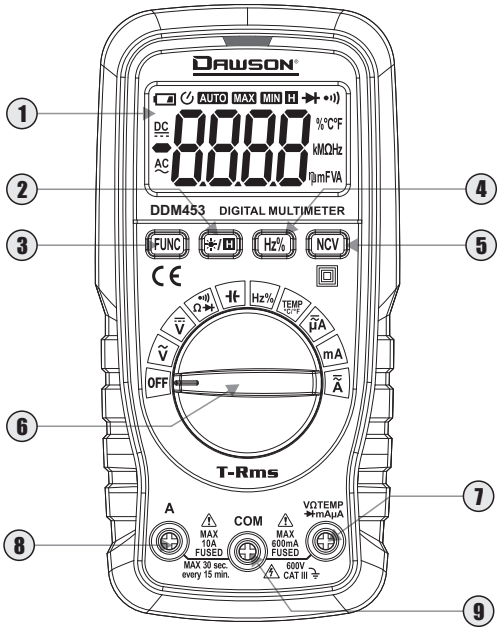
To avoid electric shock and injury or damage to the meter, observe the following safety methods:

- Check the meter before use to make sure there was no damage during transit.
- Check that the insulation on the test leads is not damaged and/or wires are not exposed.
- If any faults or abnormalities are observed, the meter should not be used and should be checked out prior to use.
- Never exceed the protection limit values indicated in specifications for each range of measurement.
- Always be careful when working voltages above 60V DC or 30V AC rms, keep fingers behind the probe barrier while measuring.
- Make sure the rotary switch is in the correct position before measurement.
- Never use the meter in an environment with explosive gas, vapor or dust.
- Always keep fingers behind probe barriers when making measurements.
- When connecting test leads to a circuit, connect the black test lead first, then the red lead. Disconnect in the opposite order.
- Turn off power and discharge all capacitors first before measuring resistance, continuity or diodes.
- Failure to follow safety guidelines could compromise the safety features of this meter.
- Do not use the meter without the battery cover in place.
- Replace the batteries as soon as the low battery symbol appears " ▭ " to avoid false reading that could lead to electric shock and injury.
- Remove test leads from all circuits before opening the battery cover.

3. SAFETY SYMBOLS

Important safety information	Ground
AC(alternating current)	Double insulation protection
DC(direct current)	Fuse
DC/AC Voltage or Current	Compliance with EU regulations

4. FEATURE DETAILS



1.LCD Display

2.Hold/Backlight Button

Press "H ☀" to hold the current reading on the display. Press the button again to release the hold. Hold "H ☀" to turn on the backlight. Hold the button again to manually turn off the backlight.

3.Function Button

Press "**FUNC**" to switch between functions or between AC/DC current.

4.Frequency/Duty Cycle Button (Hz/%)

In AC voltage/current modes, press "Hz%" and the display will show the frequency measurement. Press the button again to switch to duty cycle. Press the button a third time to return to normal display.With the rotary switch in the Hz/% position, the default mode is frequency. Press the "Hz/%" button to show the duty cycle. Press the button again to switch back to frequency display.

5.NCV Button

Hold the "NCV" button down in any mode and the meter will activate the non-contact voltage detection. Move the top of the meter towards an AC voltage source and the buzzer will sound and the NCV indicator will light up if voltage is detected. Release the "NCV" button to stop NCV detection.

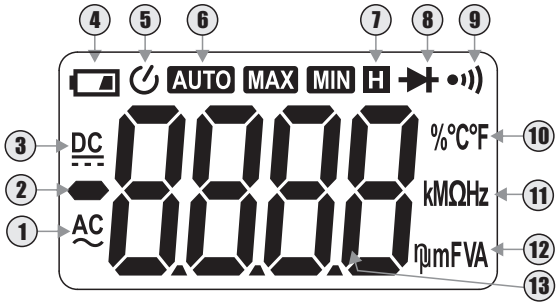
6.Rotary Switch

7.Input Jack (all measurements; current below 600mA)

8.A Jack (current measurements between 600mA-10A only)

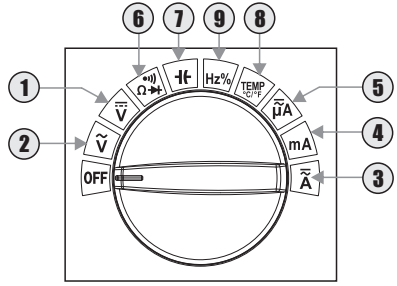
9.Common Jack (all measurements)

5. DISPLAY DESCRIPTION

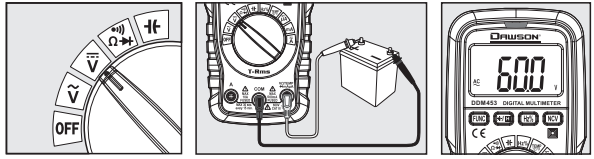


1	AC	Alternating Current	10	%	Duty Cycle Mode
2		Negative DC Value	10	°C	Temperature in Celsius
3	DC	Direct Current	10	°F	Temperature in Fahrenheit
4		Low Battery	11	kMΩ	Resistance
5		Auto Power Off	11	Hz	Frequency
6	AUTO	Auto Range Active	12	µF	Capacitance
7	H	Data Hold	12	µmA	DC/AC Current
8		Diode Test	12	mV	DC/AC Voltage
9		Continuity Test	13		Main Display

6. ROTARY SWITCH FUNCTIONS

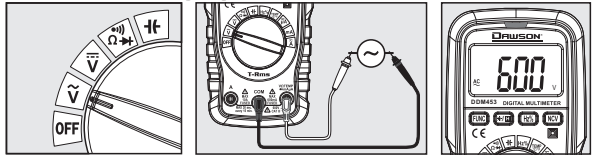


1. DC Voltage: <600V



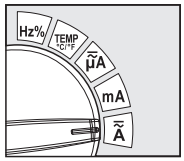
1. Turn rotary switch to DC voltage position.
2. Connect leads across voltage source/load.
3. Read voltage measurement on the display.

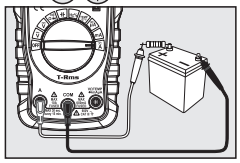
2. AC Voltage: <600V



1. Turn rotary switch to AC voltage position.
2. Connect leads across voltage source/load.
3. Read voltage measurement on the display.

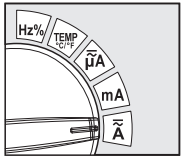
3.1 DC Current (large): <10A (FUNC) (☼)

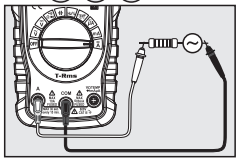




1.Turn rotary switch to A position.
2.Press FUNC to select DC or AC current.
3.Connect leads in series to circuit.
4.Read current measurement on the display.

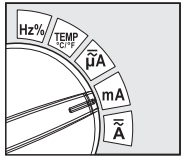
3.2 AC Current (large): <10A (FUNC) (☼) (Hz%)

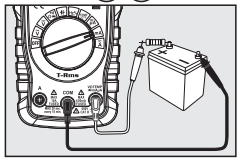




1.Turn rotary switch to A position.
2.Press FUNC to select DC or AC current.
3.Connect leads in series to circuit.
4.Read current measurement on the display.

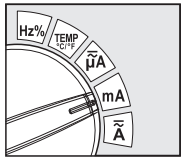
4.1 DC Current (Medium): <600mA (FUNC) (☼)

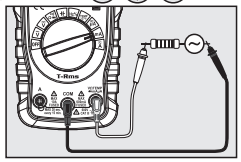




1.Turn rotary switch to mA position.
2.Press FUNC to select DC or AC current.
3.Connect leads in series to circuit.
4.Read current measurement on the display.

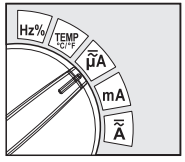
4.2 AC Current (Medium): <600mA (FUNC) (☼) (Hz%)

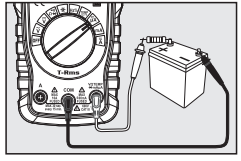


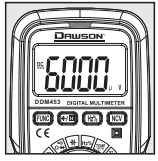


1.Turn rotary switch to mA position.
2.Press FUNC to select DC or AC current.
3.Connect leads in series to circuit.
4.Read current measurement on the display.
5.For frequency/duty cycle display, press Hz/%.

5.1 DC Current (Small): <6000μA (FUNC) (☼)

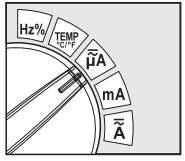


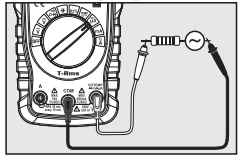


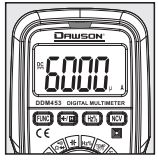


1.Turn rotary switch to μA position.
2.Press FUNC to select DC or AC current.
3.Connect leads in series to circuit.
4.Read current measurement on the display.

5.2 AC Current (Small): <6000μA (FUNC) (☼) (Hz%)

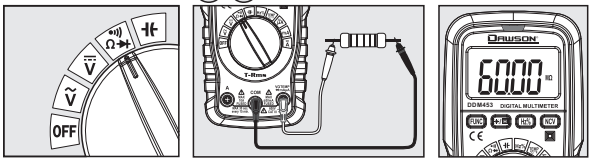






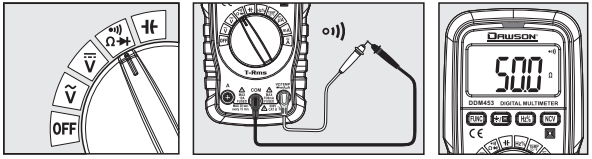
1.Turn rotary switch to μA position.
2.Press FUNC to select DC or AC current.
3.Connect leads in series to circuit.
4.Read current measurement on the display.
5.For frequency/duty cycle display, press Hz/%.

6.1 Resistance:<60MΩ (FUNC) (☼)



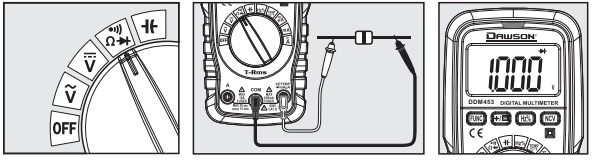
1. Turn rotary switch to multifunction position.
2. Resistance is the default mode.
3. Connect leads across circuit.
4. Read resistance measurement on the display.

6.2 Continuity: (FUNC) (☼)



1.Turn rotary switch to multifunction position
2.Press FUNC to switch to continuity mode
3.Connect leads across circuit.
4.If measured resistance is less than 50Ω, the buzzer will sound.

6.3 Diode Test: (FUNC) (☼)



1.Turn rotary switch to multifunction position.
2.Press FUNC to switch to diode mode.
3.Connect INPUT lead to anode (+) and COM lead to cathode (-).
4.Read measured forward-biased voltage drop.

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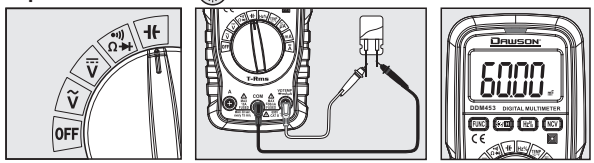
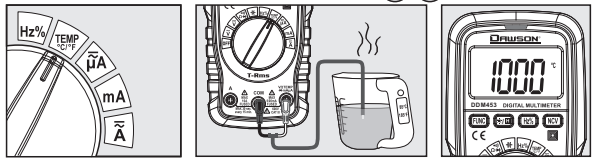
7. Capacitance: <60mF (☼)



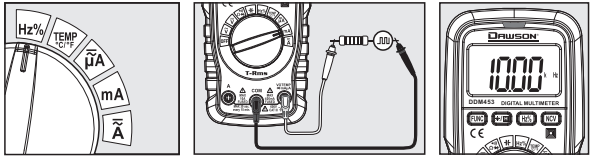
1.Turn rotary switch to the capacitance position.
2.Connect leads across voltage source/load.
3.Read voltage measurement on the display.

8. Temperature: -20°C~1000°C/-4°F~1832°F (FUNC) (☼)



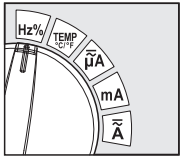
1.Turn rotary switch to the TEMP position.
2.Press FUNC to select Fahrenheit or Celsius.
3.Touch tip of thermocouple to the test object.
4.Read measured temperature on the display.

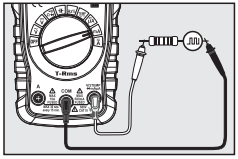
9.1 Frequency:<10MHz (FUNC) (☼) (Hz%)



1.Turn rotary switch to the Hz/% position.
2.Frequency is the default mode.
3.Connect leads across circuit.
4.Read measured frequency on the display.

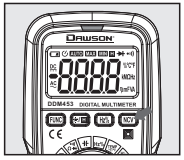
9.2 Duty Cycle: <99% (FUNC) (☀)

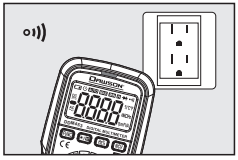




1.Turn rotary switch to the Hz/% position.
2.Press Hz/% to select duty cycle.
3.Connect leads across circuit.
4.Read measured duty cycle on the display.

11. Non-Contact Voltage Detector: (NCV)





1.In any mode, hold the NCV button down.
2.Move the top of the meter toward voltage source
3.If AC voltage is present, NCV indicator flashes/buzzer beeps.

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7. Specifications

- **Operating Altitude:** 2000m
- **Relative Humidity:** 75% max operating
- **Operating Temperature:** 0°C～40°C/32°F～104°F (<80% RH)
- **Storage Temperature:** -10°C～60°C/14°F～140°F (<70% RH)
- **Accuracy Temperature:** -18°C～28°C/64°F～82°F (<80% RH)
- **Temperature Coefficient:** 0.1x(specified accuracy)/°C (<18°C or >28°C)
- **Sampling Frequency:** approx. 3 times/sec.
- **Fuse Protection:** μA/mA input: FF 600mA H 600V
  10A input: FF 10A H 600V
- **LCD Display:** 6000 count display (5999 max reading)
- **Power Supply:** 9V battery
- **Dimensions:** 150mm×74mm×48mm / 6.3"×2.9"×1.9"
- **Weight:** 8.9oz/250g
- **Safety Rating:** CAT III 600V
- **Safety Standards:** IEC61010-1
- **Pollution Degree:** 2
- **Accuracy:** ±(of reading + # of least significant digits)

7. ELECTRICAL SPECIFICATIONS

DC Voltage Measurement		
Range	**Resolution**	**Accuracy**
600mV	0.1mV	±(0.5% of reading +2 digits)
6V	0.001V	
60V	0.01V	
600V	0.1V	

- **Input impedance: 10MΩ**
- **Max. input voltage: 600V rms**

AC Voltage Measurement		
Range	**Resolution**	**Accuracy**
6V	0.001V	±(1.0% of reading +5 digits)
60V	0.01V	
600V	0.1V	

- **Input impedance: 10MΩ**
- **Max. input voltage: 600V rms**
- **Frequency response: 40～400Hz, calibrated to rms of sine wave (average response)**

DC Current Measurement		
Range	**Resolution**	**Accuracy**
600μA	0.1μA	±(1.0% of reading +5 digits)
6000μA	1μA	
60mA	0.01mA	
600mA	0.1mA	
10A	10mA	±(2.0% of reading +8 digits)

- **Overload protection:**
  μA/mA input: Fuse(FF 600mA H 600V)
  10A input: Fuse (FF 10A H 600V)
- **Max. input current:**
  μA/mA input: 600mA rms
  10A input: 10A rms

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AC Current Measurement		
Range	**Resolution**	**Accuracy**
600μA	0.1μA	±(1.2% of reading +5 digits)
6000μA	1μA	
60mA	0.01mA	
600mA	0.1mA	
10A	10mA	±(2.0% of reading +8 digits)

- **Overload protection:**
  μA/mA input: Fuse(FF 600mA H 600V)
  10A input: Fuse (FF 10A H 600V)
- **Frequency response: 40～400Hz, calibrated to rms of sine wave (average response)**
- **Max. input current:**
  μA/mA input: 600mA rms
  10A input: 10A rms

Resistance Measurement		
Range	**Resolution**	**Accuracy**
600Ω	0.1Ω	±(0.7% of reading +3 digits)
6kΩ	0.001kΩ	
60kΩ	0.01kΩ	
600kΩ	0.1kΩ	
6MΩ	0.001MΩ	
60MΩ	0.01MΩ	

- **Max. input voltage: 600V rms**

Continuity Test	
Resolution	**Description**
0.1Ω	If measured resistance is greater than 50Ω,the meter's buzzer will sound

- **Overload protection: 600V rms**
- **Open circuit voltage: ～1.0V DC**

Diode Test	
Resolution	**Description**
0.001V	Display shows the forward-biased voltage drop of the diode.

- **Overload protection: 600V rms**
- **Open circuit voltage: ~3.2V DC**
- **Test current: ~ 1.0mA**

Capacitance Measurement		
Range	**Resolution**	**Accuracy**
10nF	0.01nF	±(4.0% of reading +5 digits)
100nF	0.1nF	
1μF	1nF	
10μF	10nF	
100μF	100nF	
1mF	1μF	
10mF	10μF	
100mF	10μF	

- **Max. input voltage: 600V rms**

Frequency (AC voltage)		
Range	**Resolution**	**Accuracy**
99.99Hz	0.01Hz	±(1.5% of reading +5 digits)
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
>10kHz	0.01kHz	Reference only

- **Signal input range: ≥0.2V AC rms (voltage input will increase as frequency increases)**
- **Input impedance: 10MΩ**
- **Max. input voltage: 600V rms**

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Frequency (AC current)		
Range	**Resolution**	**Accuracy**
99.99Hz	0.01Hz	±(1.5% of reading +5 digits)
999.9Hz	0.1Hz	
>1kHz	0.001kHz	Reference only

- **Signal input range: μA: ≥60μA rms mA: ≥6mA rms A: ≥0.6A rms (current input will increase as frequency increases)**
- **Max. input current: 10A rms**

Frequency (Hz)		
Range	**Resolution**	**Accuracy**
9.999Hz	0.001Hz	±(1.5% of reading +5 digits)
99.99Hz	0.01Hz	
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
99.99KHZ	0.01kHz	
999.9KHZ	0.1KHz	
9.999MHZ	0.001MHz	

- **Signal input range:≥2V AC rms(voltage input will increase as frequency increases)**
- **Max. input voltage: 600V rms**

Duty Cycle		
Range	**Resolution**	**Accuracy**
1 – 99%	0.1%	± 2.0%

- **In current mode:**

  Signal input range: μA: ≥60μA rms mA: ≥6mA rms A: ≥0.6A rms (current input will increase as frequency increases)
  Max. input current: 10A rms
- **In voltage mode:**

  Signal input range: ≥0.6V AC rms (voltage input will increase as frequency increases)
  Input impedance: 10MΩ
  Max. input voltage: 600V rms

Temperature Measurement		
Range	**Resolution**	**Accuracy**
-20°C~1000°C	1°C	±(2.0% of reading +2 digits)
-4°F~1832°F	1°F	±(2.0% of reading +4 digits)

• Overload protection: Fuse (F600mA/600V)

8. MAINTENANCE

This section provides basic maintenance principles, including replacing batteries and fuses.

Do not attempt to repair or perform any maintenance on the meter not included in the section below unless you are qualified personnel.

9. CLEANING

⚠ WARNING

To prevent injury or damage to the meter, do not allow moisture inside the casing. Before opening the battery cover/case, disconnect test leads from all circuits.

Clean the meter regularly with a damp cloth and a small amount of detergent; do not use abrasives or solvents. Dirty/wet input jacks can affect readings.

To clean input jacks:

1. Turn off the meter and remove test leads.
2. Brush off any dirt or contaminants from the input jacks.
3. Use a cotton swab with a cleaner/lubricant (i.e. WD40) to clean the input jack.
4. Use a new swab on each jack to prevent cross contamination.

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10. REPLACING THE BATTERY

⚠ WARNINGS

To avoid false reading that could lead to injury or damage to the meter, replace the batteries as soon as the "▭" symbol appears. Turn off the meter and remove the test leads before opening the battery cover to avoid injury or damage to the meter.

To replace the battery:

1. Turn off power to the meter.
2. Remove test leads from input jacks.
3. Loosen the screw on the battery cover and remove cover from meter.
4. Replace used battery with a new one.
5. Replace battery cover and secure to meter.

11. REPLACING THE FUSES

⚠ WARNING

To prevent injury or damage to the meter, turn off power to the meter and disconnect test leads from input jacks before opening case.

To replace the fuses:

1. Turn off power to the meter.
2. Remove test leads from input jacks.
3. Remove the 6 screws on the back case and remove back case from meter.
4. Replace blow fuse(s) with new fuses of the same electrical ratings (see specifications).
5. Replace back cover and secure to meter.

12. DISPOSAL / RECYCLE

Caution: This symbol indicates that equipment and its accessories shall be subject to a separate collection and correct disposal.